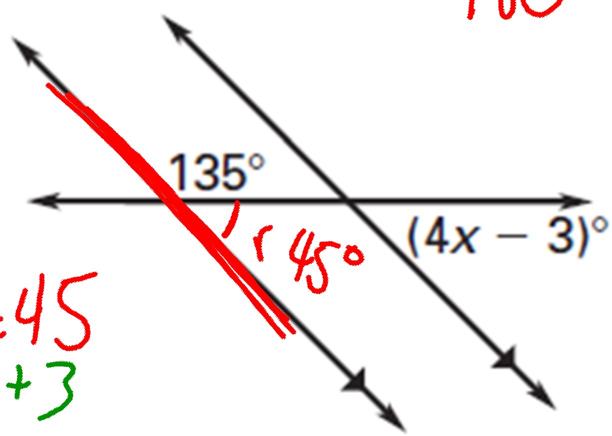
Warm up: What value of x will make the lines parallel?

$180-135 = m\angle r$

$\angle r = 45°$

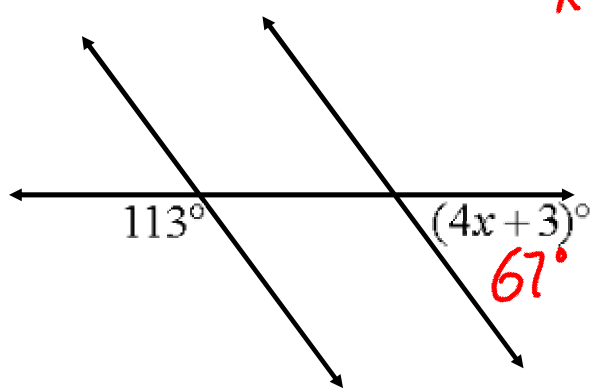
$x = 12$



$$\begin{aligned} 4x - 3 &= 45 \\ +3 \quad & \quad +3 \\ \hline \frac{4x}{4} &= \frac{48}{4} \end{aligned}$$

Warm up: What value of x will make the lines parallel? Why?

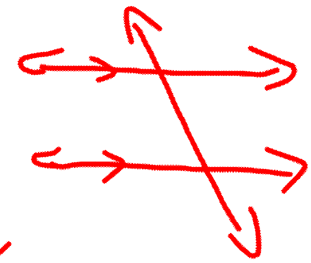
$x = 16$



3.3: Proving Lines Parallel

Target 3E Apply angle pair relationships

Review of things we know about parallel lines.



If lines are parallel then....

- Alternate Interior angles are $\cong$
- Corresponding angles are $\cong$
- Alternate Exterior angles are $\cong$
- Consecutive Interior angles are
- Consecutive Exterior angles are

SUPPLEMENTARY $= 180^\circ$

So when lines are parallel, then we have sets of congruent and supplementary angles...

What about the converse???

If Alternate Interior Angles are $\cong$

or

Alternate Exterior Angles are $\cong$

or

Consecutive Interior/Exterior Angles are SUPPLEMENTARY

or

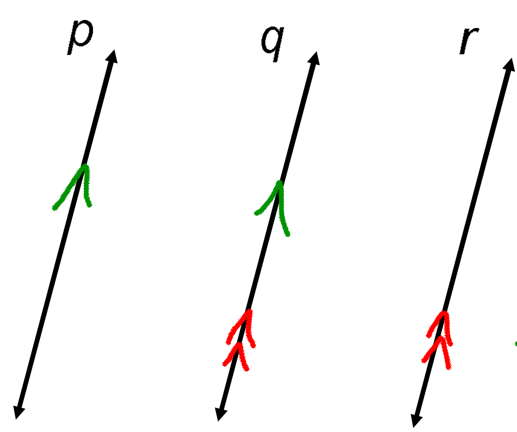
Corresponding angles are $\cong$

Then the lines are PARALLEL.

Transitive Property of Parallel Lines:

OR ANGLES

If two lines are parallel to the same line,
Then they are parallel to each other.



IF $\angle A \cong \angle B$

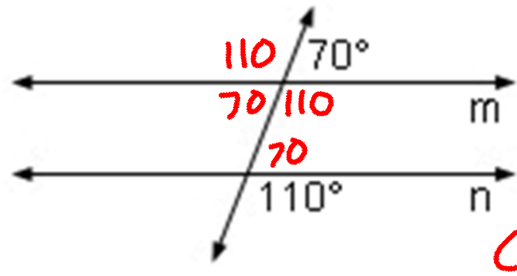
AND

$\angle B \cong \angle C$

THEN $\angle A \cong \angle C$

If $p \parallel q$ and $q \parallel r$, then $p \parallel r$

Is there enough information in the diagram to conclude that $m \parallel n$?

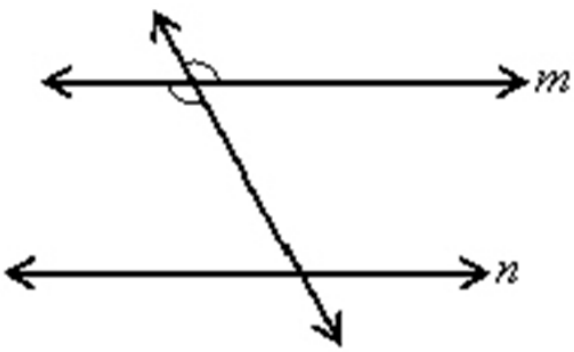


$70 + 110 = 180$

CONSECUTIVE EXT ∠S

More importantly why or why not?

Can you prove that lines m and n are parallel? If so, describe how.



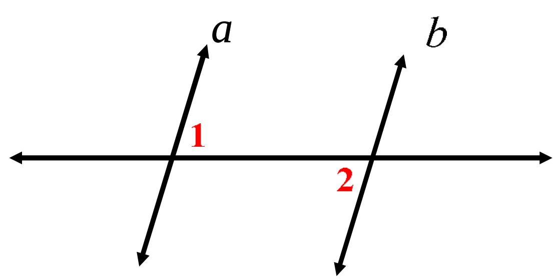
NO

NEED ∠ MEASURES
FOR LINE N

Can you prove that lines a and b are parallel?
Why or why not?

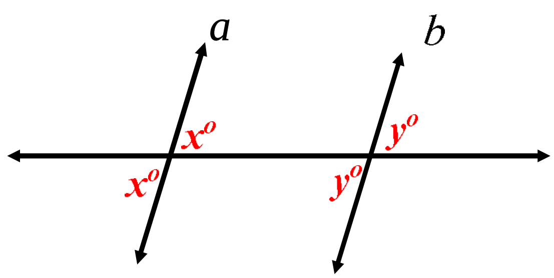
$m\measuredangle 1 + m\measuredangle 2 = 180°$

$\parallel$



NOT $\parallel$

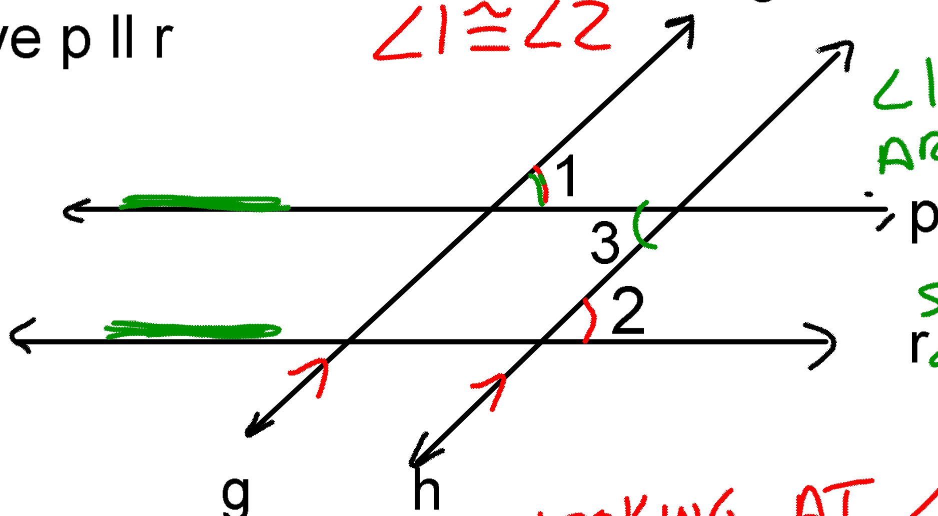
A student concluded that lines a and b are parallel? Describe and correct the students error.



Intro to proofs
The art of arguing...

Take a look at the diagram, here is what we know. We know that $\angle 1 \cong \angle 2$ and g ll h.
prove p ll r

$\angle 1 \cong \angle 2$



$\angle 1$ AND $\angle 3$ ARE ALT. INT. $\angle$S SO $\angle 1 \cong \angle 3$

LOOKING AT $\angle 2$ AND $\angle 3$

ALT. INT. $\angle$S

NEED TO PROVE $\angle 2 \cong \angle 3$